

REMARKS

Claims 1-26 are currently pending. Claims 4 and 11 have been amended. No new matter has been added by way of this amendment.

Claims 4 and 11 were objected to for informalities. Claim 4 is being amended to clarify that the flash on the upper surface and the lower surface has an "overall *combined* thickness equal to or exceeding 1 mm." Claim 11 is being amended to clarify that the flashing portion includes a first portion "formed on a first surface of the lead-frame" and a second portion "formed on a second surface of the lead-frame," and remove any ambiguity regarding the molded portion.

Claim 6 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserts that claim 6 is not fully consistent with what is shown in Figure 6, in which the air vent gives rise to a flash on the upper and lower surfaces of the frame (as recited in claim 1). However, Applicants respectfully point out that claim 6 is fully consistent with what is shown in Figure 3, in which the air vent gives rise to a flash only on the upper surface of the frame. In addition, the Examiner asserts that claim 6 contradicts claim 1 because "claim 1 shows the flash, which is formed on the upper and lower surfaces of the frame." The Examiner is mistaken because claim 1 recites that the flash is "in coherence with *one of* the upper and lower surfaces of said frame." Therefore, the Examiner's rejection of claim 6 as being indefinite should be withdrawn.

Claims 1, 16-19, and 22-26 were rejected under 35 U.S.C. § 102(b) as being anticipated by Jain et al., U.S. Patent No. 5,665,296 ("Jain").

Claims 8-12 were rejected under 35 U.S.C. § 102(e) as being anticipated by Lee, U.S. Patent No. 6,469,369 ("Lee").

Claims 2-5, 7, 20 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jain.

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Jain in view of Lee.

Claims 13-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee.

An embodiment of the present invention provides a lead-frame for semiconductor devices comprising a mold having at least one air vent from which the resin can seep out of during its injecting into the mold, and a frame having a recess or a through hole placed at the outlet of the air vent so that, when the resin has solidified, it forms a flash which is in coherence with the surface of the frame. The embodiment thus provides increased adhesion of the flash to the surface of the lead-frame, and thus prevents the formation of contaminating elements on the leads. It should be noted that the air vent (9) functions to let out the air present in the mold to prevent the formation of air bubbles in the resin. As a result, the air vent permits small quantities of resin to seep out during its injecting into the mold. The air vent, however, is not used to inject the resin into the mold. The resin is injected only through the injectors (4). In addition, because the recess or through hole is placed at the outlet of the air vent, the recess or through hole is located outside of the mold, positioned to collect the resin only after it has seeped out of the air vent.

In contrast, Jain discloses a method for assembling a plastic integrated circuit package. A plastic encapsulant is injected into first and second gates (52, 54) and flows into a mold cavity (50), where a mold flow hole (38) allows encapsulant to flow between each side of the lead frame (10) within the mold cavity (50). The combination of dual gates (52, 54) and the mold flow hole (38) simply lowers the fluid resistance and corresponding injection pressure required to fill the mold cavity (50).

There is nothing disclosed, taught or suggested by Jain with regards to an air vent or a through hole as described in the present application. Claim 1 states "a mold having at least one air vent from which resin can seep out of ... wherein said frame includes: a through hole placed at the outlet of said air vent so that when the resin has solidified it forms a flash which is in coherence with one of the upper and lower surfaces of said frame." Similarly, claim 16 states "an air vent zone of the surface that is structured for placement adjacent to one of the peripheral extrusion areas, the air vent zone including a receptacle in the surface for receiving a portion of one of the flashing portions." However, Jain's first and second gates (52, 54) function only to inject the encapsulant into the mold cavity (50) and is not exposed to air at all. As a result, the first and second gates (52, 54) cannot function as air vents (or air vent zones). In addition, the

mold flow hole (38) is located inside the mold cavity (50) and only allows the encapsulant to pass between each side of the lead frame (10) within the mold cavity (50). As a result, the mold flow hole (38) is not positioned at any outlet of an air vent (or included in any air vent zone), and cannot function as a receptacle to receive resin that has seeped out of the mold.

Therefore, because Jain does not disclose, teach or suggest all of the recited elements of claims 1 and 16, claims 1 and 16 are not anticipated by Jain and are in condition for allowance. Claims 2-5 and 7 depend on claim 1, and claims 17-26 depend on claim 16, and thus, are also in condition for allowance.

Lee is not prior art. Applicants submitted in their previous amendment (dated June 30, 2003) that Lee was filed in the U.S. on June 30, 2000. The present application claims priority from Italian Patent Application No. M12000A 001719, filed on July 27, 2000. Applicants enclosed in their previous amendment an accurate English translation of that priority Italian application, and thus, the priority claim has been perfected. In addition, Applicants enclosed a Rule 131 Declaration signed by one of the inventors, Andrea Giovanni Cigada, stating that the invention was made prior to June 30, 2000 and diligently reduced to practice with the filing of the priority Italian application on July 27, 2000. Attached to that Declaration was a letter dated June 5, 2000 enclosing a draft Italian application, which became the priority Italian application. Accurate English translations of the letter and draft Italian application were also enclosed.

Therefore, because Lee is not prior art, all claim rejections based on Lee should be withdrawn. Claims 6 and 8-15 depend on claim 1, and thus, are also in condition for allowance.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Application No. 09/917,406
Reply to Office Action dated December 23, 2003

All of the claims remaining in the application are now clearly allowable.
Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,
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